Abstract

We propose to measure the polarization transfer coefficients, $D_{l't}$ and $D_{l'l}$, as well as the induced normal polarization, P_n, in the ^{3}He($\vec{e}$,e'$\vec{p}$)d and ^{3}He($\vec{e}$,e'$\vec{p}$)pn reactions simultaneously. Recent calculations of the polarization transfer coefficients in the ^{3}He($\vec{e}$,e'$\vec{p}$)d reaction at low missing momentum have shown that the ratio of these observables is insensitive to the details of the ^{3}He wavefunction and hence provides a measure of the bound proton form factor ratio, G_M^p/G_E^p. In contrast, calculations indicate that the polarization transfer coefficients in the ^{3}He($\vec{e}$,e'$\vec{p}$)pn reaction are very sensitive to the S'-state contributions to the ^{3}He ground state wavefunction at low recoil momentum. The measurement of the induced normal polarization will provide an indication of the size of final state interaction effects.

We will measure these observables as a function of the missing momentum, p_m, over the range $0<p_m<250$ MeV/c, for values of Q^2 of 0.8, 1.5, 3.0, and 4.0 (GeV/c)^2. Since a single kinematical configuration will be used at each value of Q^2 and because the ratio of polarization transfer coefficients is independent of the incident electron polarization and of the carbon analyzing power in the focal plane polarimeter, it is anticipated that the systematic uncertainties will be minimized.

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